

**SOLID WASTE DISPOSAL: A CASE
STUDY OF CHANCHAGA SETTLEMENT**

BEING

A PROJECT SUBMITTED TO THE DEPARTMENT OF
GEOGRAPHY,

SCHOOL OF SCIENCE AND SCIENCE EDUCATION,
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA.

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
AWARD OF A POST GRADUATE DIPLOMA IN
ENVIRONMENTAL M,ANAGEMENT (PGDEM)

BY

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PGD/GED/99/2000/090

MARCH 2001.

CERTIFICATION

This project Entitled solid waste disposal a case study of chanchaga settlement by Yusufa Audu Jikuchi has meets the Regulation Governing the award of the post Graduate Diploma in Environment of the Federal University of Technology, Minna and is approved for its contribution to knowledge and is approved for its contribution to Knowledge and literary presentation.



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DEDICATION

Dedicated to my Younger Brother Aliyu A. Alkali who passed with ambition May
Allah have Mercy on him.

DECLARATION

I hereby declare that myself Composed this project and that is the outcome of my personal research effort. It has not been presented in any previous application for a higher Degree or Diploma. All sources of information have been acknowledged by means of references.

YUSUFA AUDU JIKUCHI

PGD/GEO/99/2000/090

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DATE

ACKNOWLEDGEMENT .

I wish to express my sincere profound gratitude to Almighty Allah for Continuous guidance and protection over me through the period of my stay. I so much believed that without Him nothing would have been possible.

I specifically express my hearty appreciation to my supervisor Dr.P.S. Akinyeye that brain behind my research work, for his patience in going through the manuscripts and making a constructive suggestion that pushed to a quick Completion of the write up. Mr. Suleiman Information officer Chanachga Local Governemnt Bala Usman Mohammed need to be mention for their technical guidance and necessary information.

I am almost lost for words in trying to express my appreciation to my ,family in general and friends fortheir moral support and Understanding. Among the notable onces are Alhaji Yakubu ,A.C.P, Mohammed, Balkisu, Aisha, Safiya, Manu, Mansir and Amina all of Alkali Family also Abubakar Usman, Shehu, Samaila of Ubandachi family. Usman Isah Jikuchi, Samuel Maikunkele are not spare behind who were the machine that put my work into Document.

Finally my grateful thanks are due to all lecturers of Geography department that contributed either morally materially or otherwise.

ABSTRACT

Solid waste disposal is a recurrent global environmental problem threatening the natural environment. This project critically examined and analyzed the present solid waste management in the study area. (Chanchaga). Data analysis was based on frequency percentage method. The findings of the research work includes the fact that virtually all the methods adopted for waste disposal are inadequate and in effective, the non-challent attitude of individuals in the settlement is also contributing the problems the government has not yet adequately embarked upon a massive awareness drive to educate the populace on the dangers of solid waste management.

Recommendation were advanced to forestall or check the abnormal solid waste disposal methods such as encouragement of private individuals in the business of solid waste, recycling, dumpsites should be properly looked after, other effective methods of solid waste disposal should be explored and made use of.

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CHAPTER ONE.

1.0 Introduction.

The concept waste could be technically described as any unwanted and undesirable materials that originate from industrial, mining project, agricultural as well as from residential, commercial and municipal uses of the urban areas. Waste, could also be looked upon as any gaseous, liquid a solid material that is thrown away because it has no further use by the owner. Generally speaking, waste emanates from a variety of sources, all of which culminates from human activities.

It is paramount to acknowledge the fact that among all types of wastes, solid waste is the most outstanding one because of the rate and scale of discharge of solid waste. The severity also supercedes the others. Solid waste emanates from different facets and takes various forms and volumes. Garbage is one of prominent solid waste form and it consist of waste food which will decay or not, rubbish which will decay, and plastics, rags, papers, tin can, bottles and polythene bags. A voluminous quantity of waste is generated from the agricultural sector, in the form of animal waste and carcasses, soften vegetables and fruits. Some waste could emanate from industrial processes or from the manufacturing processes of industries. Usually it comes as wastage end products and or process mistakes. In addition, some of the waste comes from commercial hospitals, recreational centers and institutional places.

Another way through which waste emanates, is the construction and demolition of structures which includes bricks, wood, and stones from buildings. In fact, waste could take numerous forms because, waste implies all over used, unused, misused and unwanted material which is liquid or gaseous, and is no longer needed for its original use/purpose waste when deposited indiscriminately results or predisposes to many disease conditions.

Poor solid or waste management causes numerous hazards and nuisance to the public and the environment. Among these myriads of problems includes, light refuse that could be blown by wind to a near by water course or drain and course blockage and or floods, the natural beauty of the environment is distorted by the litters found wantonly in the surrounding, the accumulation of solid waste provides a favourable breeding place for insect vector and several disease causing organisms and some traces of foal matter in refuse enhance faster spread of intestinal diseases.

1.1 THE CONCEPT "SOLID WASTE"

Solid waste could be viewed form two perspectives either from the non-liquid form or from the gaseous form, but from whatever perspective one look at it, solid waste are materials (either in non-liquid or gaseous) which has become

obsolete hence its discardment by the owner or user. Previous empirical work, has asserted that about 10 to 11 kilogram of solid waste is generated per capita. The estimation is a reality because of the trend and scale of solid waste disposal. These waste materials may be inform of garbage that is made up of waste food which will decay or not, rubbish which will not decay and encompasses papers, plastics, rags, tin cans and bottles. Solid waste comes from both household and non-household activities. Solid waste in our cities are being affected by some variables, notably level of income, population concentration and development, solid waste are proliferating the environment and causing immense hazards or damage to the environment. The presence of solid waste in the environment is causing a lot of problem to environmental managers. The issue of solid waste disposal is of pertinent relevance to humanity.

Solid waste disposal has been a big problem because of lack of adequate and appropriate mechanism for discarding the waste. Solid waste disposal is the removal of refuse from ~~where~~ it was generated to a place of disposal. Disposition of solid waste can be said to have been made when it is collected, transported, treated and disposed off to a place where it may not constitute environmental menace. The necessity for proper solid waste collection and disposal stem from the concern that improperly or treated waste can feed and harbor disease bearing pests (rats, flies, Mosquitoes) and endanger public health. Refuse collection is the primary purpose of refuse

removal and disposal of solid waste especially garbage to minimize the possibility of disease and to reduce the effects of littering the environment and pollution. But the attitude of the inhabitants to keeping good environment may contribute to the piling of refuse.

It is pertinent to acknowledge the fact that solid waste generation and disposal become acute with increase in population and urbanization, it could be seen littering all parts of the urban cities and mountain garbage of refuse goes un-collected. Solid waste disposal is one of the greatest problem of Nigerian cities today. An over the urban centers, mounds of refuse remain uncollected for days, sometimes weeks and eventually become dumpsites, posing serious health hazard.

Open dumping method is one of the most common method been around towns and cities. This method has a lot of demerits such as polluting the atmosphere, reduces the aesthetic value or scenery of the environment and it also reduces open land for development. Solid waste accumulations are beginning to produce social, economic and environmental problems of significant proportion. Using dumpsites is not environmentally sound as such should be discouraged.

It is pertinent to note that the effective management of refuse requires the contribution of stakeholders. The already demarcated roles of among

stakeholders like state Government, Local Government, the private sector, NGO's and individuals must be performed at the right time, by the right person at the right place. Moreover, the legal and institutional frame works, funding arrangement, resources management and enlightenment campaign are the determinant of the success of the exercise or otherwise.

1.2 STATEMENT OF PROBLEMS

The observed trend in the ever-growing heaps in Chanchaga settlement is of great concern to all meaningful environmentalist and any environmental authority. The increase in population of Chanchaga settlement is related directly to the corresponding increase in solid waste generation at an alarming rate. The rate of generation of solid waste in Chanchaga settlement obvious exceeds the rate of refuse collection from the dumpsite. The refuse heaps serve as breeding ground for some biological vectors, vermin and rodents. Those constitute serious of public health problems in the Society. Lack of effective government programme and poor private participation in the business of solid waste disposal in Chanchaga settlement and the state in general is detrimental to the principle of sustainable development.

Lack of effective and proper solid waste disposal system in the study area (Chanchaga) is posing a great threat to the environment. Environment

problems such as pollution, reduction the beauty of the environment, contamination of ground water and the refuse serves as breeding ground for vectors of diseases. There is immense need to study the present system of solid waste disposal and to evaluate and analyse its effectiveness as such, the project will serve as a veritable tool to examine the structure parties and issues involved with a view to establishing measures to change for the better. The need to improve and standardize the way by which solid waste can be properly disposed as such, the study is worth while.

1.3 JUSTIFICATION

Solid waste disposal is very important for the environment to be sound. A broad framework study of the existing works of solid waste disposal and an in-depth evaluation of new measures to reduce the spread of solid waste is imperative. The project will attempt to evolve new technical measures of disposing solid waste. An object and comprehensive data on the present disposal method will certainly pave way for solving the long tasting problem of solid waste management.

Chanchaga as a settlement is be-deviled with the grave problem of waste disposal generally, this study will tend to proffer effective means of solving the inherent problem of waste disposal, it will also examine the dumpsites and their suitability as dumpsite. The study becomes more significant considering the problem of effective solid waste disposal, hence the

project is absolutely worthwhile. There is a great and vital need to curb or combat the present trend of solid waste disposal in the study area and such study viable data and information is going to be secured and used effectively.

1.4 AIM AND OBJECTIVES OF THE STUDY

The primary aim of the study is to examine and evaluate the present solid waste disposal systems in the study area, and also ascertain the extend of menace associated with such disposal systems. The study will also attempt to proffer effective and cost-effective alternative methods. Solid waste disposal is a threat to environmental managers and great concern is shown towards evolving lasting solution to the problem.

SPECIFIC OBJECTIVES.

1. To examine and ascertain the various sources of solid waste in the study area.
2. To study the present disposal methods in the area and to evaluate its effectiveness.
3. To advance plausible recommendation towards proper solid waste disposal.

1.5 SCOPE AND LIMITATION OF THE STUDY

The study will be restricted to Chanchaga settlement due to the limitation of

time. Random sampling will be adopted in distributing the questionnaire because not all stakeholders can be reached within the stipulated time. Time constraint will affect the comprehensiveness of the study.

Some of the questionnaires distributed were not returned and could reduce the effectiveness of the analysis. The Local Government area, which Chanchaga settlement falls into, has no data with respect to solid waste management, which would have helped in solving some problems.

1.6 STRUCTURE OF THE THESIS.

The project entitled solid waste disposal will employ the use of questionnaire as primary source of data. Random sampling technique will be used in administering the questionnaire. One hundred questionnaire containing fourteen questions were distributed to all stakeholders but only sixty-six were filed and returned.

The project seek to examine the existing solid waste disposal methods, its effectiveness and otherwise. Attempts are to be made towards checking the wanton disposal of waste in Chanchaga Local Government, Data analysis used was the frequency-percentage method.

CHAPTER TWO

2.0 STUDY AREA

2.1 HISTORICAL BACKGROUND OF MINNA (C.L.G)

Minna being the headquarters of Chanchaga local government derived its name from Gbagyi (Gwari) word 'Min' and 'Na' the word means spray and 'Na' fire the town originally was on the hill at sayako and walls (ganuwa) built around it. There were also Gbagyi towns and villages in and around the present site of the modern Minna.

In the olden days, at a certain period of the year, all villages far and near Minna town on the hills used to extinguish their fire for the New Year fire, which was usually fetched from Minna town. This practice of annual extinguishing or spraying of fire gave the town on the hill its name 'Mina' with single 'n' the additional 'n' in the word 'Minna' was the making of colonial master to suit their pronunciation.

The Villages then that make up minna were Gbangbapi, Gbadnai, Shango, Bosso, Ebbnyi, (**Maikunkele**) and Gbaiko. Most of these villages now fall under Bosso local Government with the exception of Gbangbapi and Gbadnai.

The construction of railway line from Baro through Mina in 1911 is one of the factors that led to its' becoming the Administrative headquarters of the old Niger province. This paved way for strangers to settle in the Town, and while some settled permanently, others only worked as civil servant and to large

extent trading. These strangers who naturally could not live with the natives in the hills nor the surrounding villages built their huts beneath it.

It should also be stressed that Minna strategic location with relatively easy accessibility from all parts of Niger State and other parts of the country through railway line and perhaps its proximity to the Federal Capital, Abuja exposing it further to the outside world, made it suitable for a state Capital.

Minna was made first headquarters of Chanchaga local Government, since the creation of Niger State in 1976, although it still maintained its headquartership of Minna Municipal Council with all the administrative and functional requirements of a full pledge Local Government, when the then Chanchaga Local Government was moved to Kuta as Shiroro Local Government, it did not enjoy the Federal Government recognition until July 1989.

However the creation of more Local Government in 1991 by the Babagida administration saw the split of the Local Government into three to have Bosso and Paikoro in addition.

2.2 GEOGRAPHICAL LOCATION:

Minna extends from North by its boundary with Bosso Local Government at KLM 8 from center of Minna town. It is bounded on the east by Bosso extending to South and West.

Minna today lies on latitude $9^{\circ} 37'N$ Longitude $6^{\circ} 33'E$, on a geological base of undifferentiated basement complex rock of mainly gneiss and magmatite situated at the base of prominent hills in an undulating plain. Between these

two hills Paida and Minna Gwari hills runs the valley of Suka river which flow during raining season .The whole of the surrounding of Minna is very rocky.

Presently Minna enjoys a climate typical of the middle belt zone. The raining season start around April and last till October, it has mean annual rain fall of 1334MM' (52 inches) with September recording the highest rains of 300MM (11.7 inches). The mean monthly temperature is highest in March at 30.50⁰C (85⁰ F) and lowest in August at 22.3⁰C (72⁰F).

2.3 POPULATION:

In 1988 Minna was projected to have 229,521 populations, which is expected to increase to about 263,946 by 1994.

However 157,159 was the census figure announced by the national population Commission base the 1991 census figure and expected to increase to 176,734 by 1994. And 214-884.by years 2000.

2.4 MAJOR TRIBES/ETHNIC GROUPS:

Many ethnic exist: - Minna. The Gwaris were the original settlers and probably the most numerous. The Hausa came in from around 1905 at the coming railways to Minna and their population is infact as much as the Gwaris today. Other ethnic groups include the Nupes, Yoruba and Ibos. The rest which constitute minor groupings are Fulani's, or Kamukus, Kambaris and Igbiras.

2.5 NUMBER AND NAMES OF DISTRICT IN THE COUNCIL

Chanchaga Local Government comprises of one (1) district, Minna district with seven ward namely:- (1) Nassarawa (2) Limawa (3) Sabongari (4) Makera (5) Kwangila (6) Tudun -Wada (7) Kpankungu.

Former District under Chanchaga are

- Kuta.
- Paiko
- Kafinkoro
- Bosso
- Galadima Kogo

Before 1984 (Minna Municipal only)

However, the political demarcation of the district is divided into ten (10) namely:

- | | |
|------------------------|--------------------------|
| (1) Mina Central, | (2) Minna South, |
| (3) Limawa 'A' | (4) Limawa 'B' |
| (5) Makera | (6) Nassarwa 'A' |
| (7) Nassarawa 'B' | (8) Sabon Gari. |
| (9) Tudun – wada South | (10) Tudun – wada North. |

2.6 SOCIAL LIFE INCLUDING SOCIAL GROUP, MAJOR RELIGION AND FESTIVAL.

2.5 RELIGION :-

Traditional religion was a medium of fostering Minna Gwari Art. Both Islam and Christianity are alien to the ordinary Gwari man. Before the introduction of these religion into Minna, the Gwari had her own traditional religion which is the deity worshipped called SHEKWO (god) through defied unique natural objects such as rocks which were closely associated with their ancestors. Besides, they had gods of different times and purpose which were

symbolized with objects that have now turned to be masters of pieces of Art. The main fetish honoured was KARMA and the most efficient was called JIBADA.

Another fetish worshipped by the Gwaris was DAWUYA and it was worshipped to Celebrate the new Corn shoot which began to pierce the earth. During this Ceremony the priest of DAWUYA was believed to be spirit of their ancestors. Local Liquor and a Goat was used in the sacrifices^{and} the blood was an important means of communication with the spirit of the ancestors.

To the other inhabitants who are not indigenous to Minna like Hausa, Yorubas, Nupes and Igbos had both Islam and Christianity as their major religions. Christianity was popular among the Yorubas, Ibos and few Gwaris, while Islam had hundred percent of its adherent among the Hausa and Nupe elements in Minna.

2.6.2 ART.

To be able to arrive home in conversation was an art to Gwariman. It is often illustrated by proverbs, Similes and even songs. This was one of the qualities of maturity and so people endeavor to acquire the art.

The peculiarities of Minna art is further projected in Musical instruments. These instruments do not possess a single characteristic of either East or the Western Civilization influences. The ^AKBULU AND Kalangu music gives a great account of this. With these mini Musical festivals were held during merry making, religious celebration (application to Gwaris) and installation of a chief.

Architectural designs too helps to interpret some of the intricassions of Minna. The round mud huts with thatched roof noticeable in Paida are a common feature of people's settlement in Minna.

Other objects which Characterize Minna art are tools used by the people. Agricultural tools like hoe handles, hunting tools like bows and arrows even wood cutlers like the axe present a unique distinction.

2.6.3 BLACKSMITTING is mostly done in Makera area of Minna. Blacksmithing are mostly involve in the manufacture of agricultural tools and implements from scrap iron which was melted or heated and beaten down.

WEAVING AND LEATHER: women cloths made by many women in the area . The raw cotton which was the raw materials used in these industry was not grown around Minna and therefore was brought in from Zaria Dyes used in dyeing the cloth and tread were made by the Yorubas.

Fancy leather works were made in the town to small extent and services of shoemakers were provided and were capable of making or mending shoes.

2.6.3 TAILORING AND BARBING:

Tailoring is done to a quite large extend. Tailors usually made a large profit owing to a rapidly with which they turn out garment with a machine.

As regards to local barbing, most important personalities in the town were said to be the barbers.

2.6.4 APPRENTICES:

As there was no technical schools for Children to learn a trade in these days and even now, they are often apprenticed to either a painter, blacksmith,

goldsmith and watch repairs or of whatever trade they decide to follow. The apprentice work free for the master who in turn taught them the trade and usually provided them with clothing and food.

2.7 MAJOR ECONOMIC ACTIVITIES AND OCCUPATIONAL GROUPS.

2.7.1 FARMING AND TRADING.

The main economic activities of Minna took the posture of a market center, immediately converging of people started around 1905 due to the construction of the railway tracks. Much of the produce in the market was brought from outlying areas, especially by the Gwaris who brought yams, and food stuffs like Guinea – corn (Dawa) Beans (wake) and some Rice (Shinkafa) since most of Gwaris are farmers occupationally.

Secondly the middle men (Dillali) intercepted those carrying goods from the farm to the market. This method has advantages for both buyer and seller. The buyers, unlike the seller, was conversant with the current prices in the market and can adjust his or her buying accordingly .

There were some trading companies in Minna where much Local trade was done. They were the Niger Company, Trading Association of Nigeria, Lagos store, John Holts and Tins Areas of Nigeria.

During the fasting period for Muslim(Ramadan), trading activities in Minna tends to fall and some companies often record a loss on their account especially the Canteens.

2.7.2 INDUSTRIES:

This existed in Minna locally and also made use of available Local materials, notable among this is the locally made Aluminum pots industries mostly found at Tudun – na – Tsira (Unguwar Kaje) beneath Minna Hill.

CHAPTER THREE

3.0 LITERATURE REVIEW

John (1999), defined solid waste as non liquid or gaseous material which as become obsolete hence its discardment by the owner or user. Solid waste, especially in the development world, comes from different sources. The sources are classified into domestic, institutional, commercial, Agricultural and industrial (Usman 1996) each of which can further be examined based on the socio-economy and culture of the society, that determines the composition of the refuse.

Olanirun (1995) stated that "one of the major environmental problems facing Nigeria, especially in the major cities, is poor solid waste disposal of the municipal (Local Government) state and material levels." Apart from the huge tons of solid waste generated, a much more serious and intractable problem is the attitude of Nigerians with regards to solid waste disposal. Indiscriminate dumping of solid waste (refuse) is the order of the day in most urban areas. Refuse is dumped on the road sides, in the streets, gutters, markets and any open space". This attitude makes it difficult for any management authority to have an organized system of collection and disposal since the dumping is done wanton. Therefore the cost of its evacuation increases, exhausting the source resources available for solid waste management. The objective of solid waste management according to Ukpala (1986) is to collect, transport, treat and finally dispose off the waste hygienic and authentically acceptable manner at the

lowest possible cost. Similarly, Kent and Ademiluyi, (1998) saw waste management /disposal Scope as the elimination, minimization, reduction , separation, segregation collection storage , transportation, disposal, Treatment , sales and recycling of waste. It involves maintaining records of quantities, composition, destination and proof of disposal. Regular maintenance and audit of waste management activities is also included. To this end, Savas (1977) Opened that solid waste management centered around how to remove the waste, how to assure compliance on the part of the citizens and who should perform these duties and how to pay for them.

The presence of waste wantonly in urban areas has not only posed a threat to public health " but it is also a source of pest and Vermin breeding ground and source of fire out – break. It also constitutes problems to traffic flow near the market most especially where management/ disposal is poor. Waste management authority are faced with the task of choosing the best option for managing or disposing solid waste (Adoeye 1999) Suggest three principle methods of disposal " They are sanitary landfill or land reclamation, Incineration and composting ". The three methods have advantages and disadvantages, especially for an agency that may initially concerned itself with collection (Out of sight) and disposal to achieve political goal .For the management of solid waste in our urban and rural areas the concept of environmental sanitation came into being .Environmental is the control of those factors in mans physical, mental and social well-being (W.H.O). Similarly, the world book encyclopedia define it as the science of controlling man's

surrounding to promote health and comfort, of the process of timing the environment so that it will no longer constitute hazard to man. The global view and on waste was summed up by the population report (May 1992) which stated that " millions of people throw out waste from industrial plant, power generating stations, refineries, tanneries and hospitals once these chemicals has been disposed into water ways, land fills and air, it is difficult and very expensive to remove them" therefore, any authority charged with the responsibility of waste disposal must be having it difficult to discharge the duties especially land fill sitting and maintenance.

The composition of solid waste in our cities is been affected by some variables, notably level of income, population concentration and development. Emeka (1988) recognized societies struggle against poverty as a contribution to environmental problems of the cities. Hence, he identified street traders and kiosks operators in model housing estate as some of the greatest generators of refuse as they can not enjoy quality environment on empty stomach. Solid waste collection by household and its storage either by individual household of community is a very important determinant of a successful waste management system. The storage system of refuse in any society is determined largely by the available technology, the social and economics status of the society, by and large the role government plays in waste management are related. The efficiency and effectiveness of solid waste collection is intimately related to the method of household or communal storage selected . (Sandara 1994)

waste generation rate for 30 countries shows a range of 0.4 – 0.6 cap/ day for low income countries and 0.7 - .8 kg/ cap/ day for industrialized countries. Some impression were created by a survey by the urban development Bank of Nigeria (UNDBN) 1997 on waste generation by weight per capital. The maximum was 0.77kg/cap/day recorded in Asaba while the lowest ^{was} 0.25kg/cap/day in Jos.

The Waste generation various ecological zones with the highest value of 49kg/day in the tropical rain Forest and lowest value of 0.37kg/day in the mangrove. The corresponding rates for Guinea and Sudan Savannah are 0.41kg/day and 0.4kg/day respectively, Oyinlola (1998) in a study in Kaduna, which is one of the areas Vulnerable to solid waste generation, have shown to generate 257,837 in 1982, 280,925 in 1985, 324,084 in 1990 and is projected to generate 4,031,314 in the year 2000 (FMHE, NEST 1991). It is therefore established that waste generation is daily on the increase , as population and per capital income of the individual increase. Solid waste generation increase with an increase in the income of individual in the society .

Solid waste disposal methods varies from individuals to individuals. Burning of refuse is one of the methods adopted by some people. Most of the urban centers fire is often set on mountains of refuse to reduce the size of it. It is said that burning reduces the amount of waste to between 10 – 15%. But open burning of dumping sites cause the pollution which may result into respiratory disease. To check indiscriminate burning of refuse, incineration is now being used. Incineration is the controlled burning of solid, liquid or gaseous

waste (USEP,1978).As communities move against open dumps and uncontrolled burning of refuse, one response is the sanitary landfill. Frank and Raymond (1978), Nduka (1985) Okpala (1986) solid waste are placed in a trench or suspend in thin layers over a prepared area of land, compacted and covered each day with a required amount of cover material.

Some of the obvious problems of this method, are increasing shortage of land in urban and ground water contamination through leachate. To avoid leachate, FEPA (1991) stated that a surface impoundment shall have a liner that is designed, constructed and installed to prevent any migration of waste out of the impoundment to the adjacent subsurface soil ground water or surface water at any time during the active life (including the closure period) of the impoundment. It is importantly to note that reusable materials are lost. Solid waste can also be dispose off through combusting. In most Nigeria urban centers heaps of refuse most especially those containing food remains (e.g. fruits) or when in contact with water may decompose to be-come manure. Molly (1999) observed that organic waste such as paper food scraps, town dipping and even human waste are valuable resources. In industrial countries, food and yard waste alone accounts for some 36% of the municipal waste stream. European cities are leading a trend toward composting, which transforms this cast off organic matters into product that invigorates agricultural soil. The problem with this method of disposal is the lost of re-usable materials and source of income to others.

Recycling is of the recent and most effective method of waste disposal. Recycling is the processing of such a way as to recover some useful; (raw) materials from it for further use (Okpara 1986). European countries are leading the pact of nations in recycling useable materials. In this process, the role of scavengers recycling useable materials. In this process, the role of scavengers is recognized. Scavenging, involves the selective picking of reusable, recyclable or saleable material from waste (Kunle et al 1986). In Cairo Zabbalean (People who picked recyclable waste did it so thoroughly that only about 15% of the original volume is discard at the dump sites (UNCHS 1985). In Nigerian urban centers waste pickers can be removing reusable materials from city trash.

Some of the problems of solid waste management are how to remove the wastes, how to assure compliance on the part of all citizens, who would perform these duties ,and how to pay for them (Savas 1977). Solid waste collection, transportation and Disposal in Nigeria are generally ineffective or non-existent. It is poorly administered with little clear definition of functional authorities, performance, Operational Co-ordination and financial accountability (USEPA 1979). The views expressed above states some of the problems of solid waste management in this part of the world. These problems need to be carefully studied, analyzed with the ultimate goal of finding solution to them. People's attitude of dumping refuse wantonly is a major problem of solid waste management. Adults and children charged emptying of household refuse often does that inadequately some empty the waste containers some meters away from their houses, some in nearby drainage, yet others near the community

depots. On the poor sanitary habits and attitudes Egunjebi (1985) started that, we must not underestimate the role of habits and attitudes of the people in keeping a sanitary environment. This brought to mind environmental sanitation Task force constitutes by the Federal Military Government in 1984 after launching of WAI fifth phase.

CHAPTER FOUR

4.0 METHODOLOGY.

4.1 DATA COLLECTION.

In order to collect data for the research work, some of the relevant sources of data collection of primary and secondary sources were employed to give in depth information for the work. To get first hand information and data from all stakeholders, questionnaire, personnel interview and the use of journey were employed. The methods adopted are discussed below.

4.2 QUESTIONNAIRE.

A structure questionnaire was designed and distributed to individuals in the study area (Chanchaga). Relevant and pertinent questions were asked and options were provided. One hundred questionnaires were distributed out, only 66 were filled and returned. The questionnaire provided the research work with ample relevant information /data for the research work. The questionnaire consist of fourteen questions.

4.3 RECONNAISSANCE SURVEY.

Physical observation/ survey was carried out to ascertain the real and actual problems of dump site inventory of the observed environment was taken and logical conclusion were drawn. Physical assessment of the environment gave an analytical view of the menace of solid waste. Various dump-sites were visited in view to find or evaluate the adequacy and effectiveness of the method use for solid waste management.

4.4 PERSONAL INTERVIEW.

Personal interview with individuals residing in the study area was done. This interview method presented the opportunity of personally interacting with the residents of the study area, and this provide to be effective because more facts were revealed that could have gone un-noticed. Some of the people found directly dumping refuse on dumpsite were interviewed.

4.5 SECONDARY DATA.

Secondary data were also sourced from journals, text books and thesis that have directed bearing to the project. Solid waste disposal has been a serious global problem and a lot of research work has been carried out and this fact, makes secondary source of data available.

4.6 DATA ANALYSIS.

Data analysis for the project centered around frequency percentage method. This method of data analysis obviously simple, effective. Descriptive statistic of frequency and percentage were used for the final analysis.

The data analysis involves the calculation of percentage from the frequency obtained exploration based on the table were given below each table. Below is example of the frequency percentage table used.

DISPOSAL METHOD	FREQUENCY	PERCENTAGE
Use of dumping sites		
Incineration, method		
Open system"		

CHAPTER FIVE

5.0 DATA ANALYSIS AND DISCUSSION OF RESULTS.

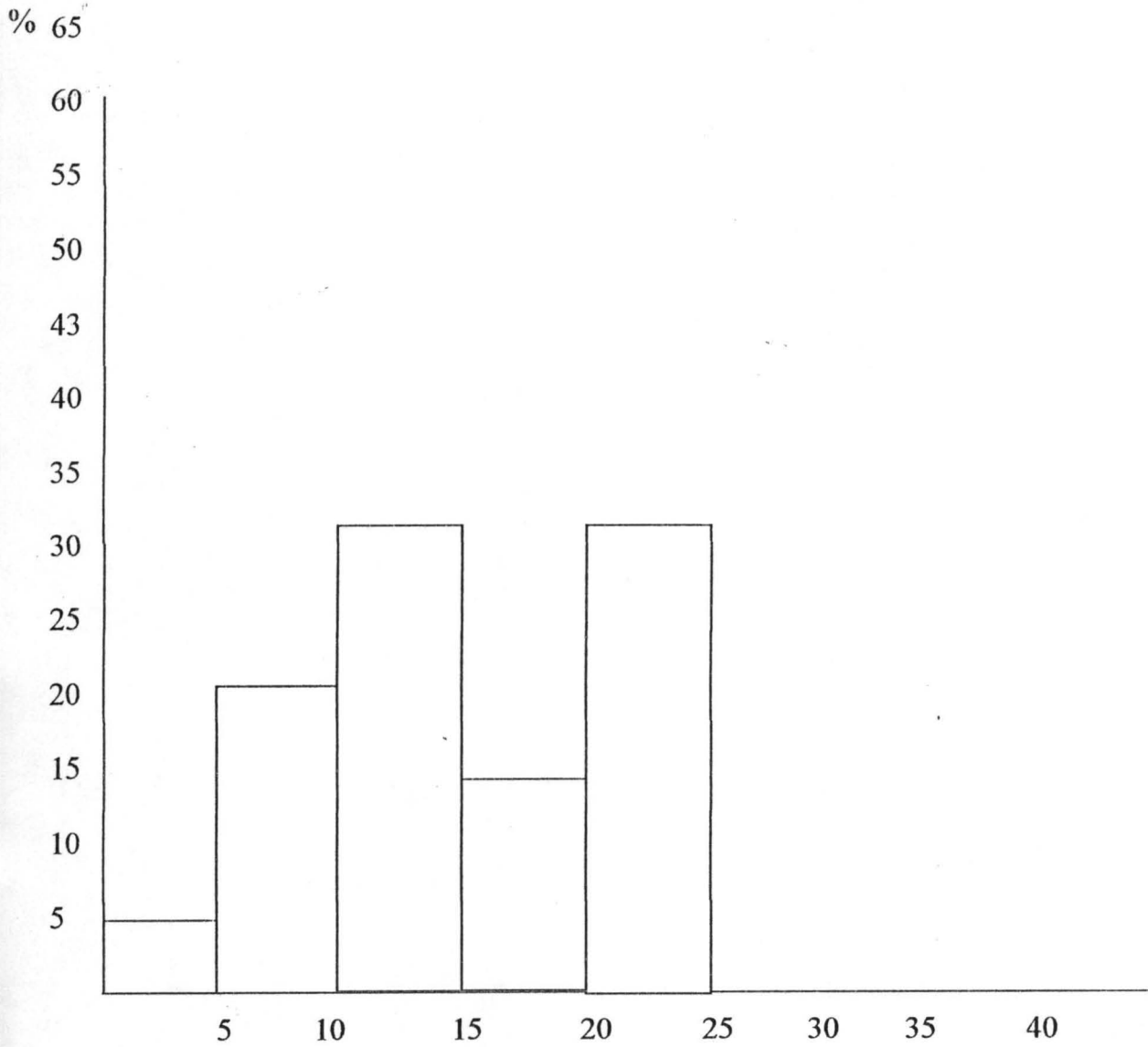
As earlier stated in chapter one, data analysis based on frequency – percentage method. Some of the question were erratically analyzed and vital deduction were made as a way descriptive data analysis.

Table 5.1 Size of household.

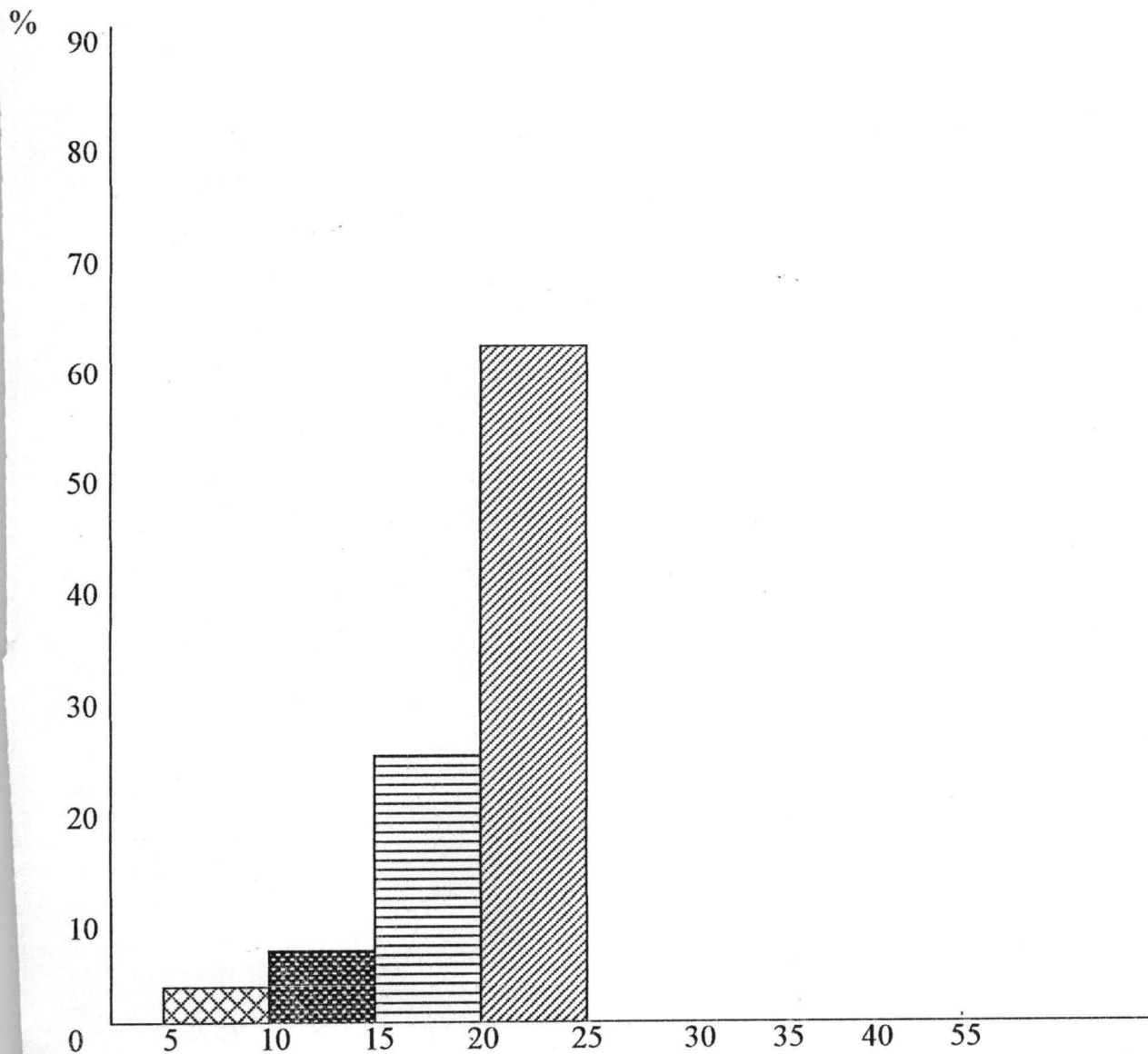
Size of household.	Frequency	Percentage
< 5 persons.	3	4.6
5 – 10 persons.	14	21.2
10 – 15 persons.	20	30.3
15 – 20 persons.	09	13.6
> 20 persons	20	30.3
Total	66	100

Source: Survey data 2001

From table 5.1 the highest percentage of 30% was obtained for the size of household who range between 10 – 15 persons and > 20 persons . 4.6% of the respondents family size < 5, 21.2% between 5 – 10 persons while 13.6% between 15 – 20 persons with respect to family size. Demographic phenomenom is very vital to this study. The deduction here is that families with more population are expected to generate more waste to the environment. Waste generation is directly related to population growth. As such, the



HISTOGRAM AGAINST TABLE 5:1



Histogram against TABLE 5:3

Keys:



= Scraps of metals



= Left over food and leaves



= Ceramic and plastics



= Paper and Polythene

household with bigger number of population will certainly generate more waste compared to household with less population.

Table 5.2 Waste Disposal Method.

Method	Frequency	Percentage.
Dump site.	8	12.1
Near by Pit.	58	87.9
Incinerator.	-	-
Total	66	100

Source: Survey data,2001.

Table 5.2 indicates that 12.1% of the respondents use the dump sites for refuse Dumping,87.9% use the nearby pit for disposal while non of the respondent claimed to use the incinerator method of waste disposal. The fact that majority of the respondent use the nearby pit method attest to the fact that the environment is at the risk of population. The near by pit method is not adequate and effective, as such should be discouraged.

Table 5.3. Type of refuse generated.

Type of Refuse	Frequency	Percentage.
Scraps of metal	1	1.5
Left over food and leaves	05	7.6
ceramic and Plastic paper	18	27.3
and polythene	42	63.6
Total	66	100

Source: Compiled by the author.

The type of refuse generated varied from different household. From table 4.3, 7.6% generate left over food and leaves, 27.3% generated ceramic and plastic, 63.6% generated paper and polythene and lastly 1.5% generate Scraps of metals as refuse type. This shows that in the study area, most of refuse is composed of paper and polythene and this was evidenced during the visit to the study area and the dump sites. Papers and polythene in both domestic and commercial activities could be responsible for the proliferation this type of waste.

Table 5.4 collection of waste from dumpsite.

OPTION S	FREQUENCY	PERCENTAGE.
Government authorities.	66	100
Community labour	0	0
Private organization	0	0
Individuals	0	0
Total	66	100

Source: Survey data 2001.

Table 5.4 shows that 100% of the respondents confirmed that only government authorities are saddled with the responsibility of collecting refuse from the dump site. Government alone cannot effectively collect the refuse from the dumpsite, private organization and individuals should be encouraged into participating on refuse collection for some reason. Individuals are of the

view that the collection of the refuse should be done by government alone, this impression should be disabused. Everybody is a stakeholder in this business.

Table 5.5 Frequency of dump site clearance.

OPTIONS	FREQUENCY	PERCENTAGE.
Not at all	-	-
Not often	42	63.6
Often	24	36.4
Very often.	-	-
Total	66	100

Source: Survey data 2001.

The rate or frequency at which the clearance of the dumpsite is carryout will give an in depth knowledge on that seriousness of the authorities in charge. Table 5.5 shows that 63.6% of the respondent accept that clearance is not often, 36.4% agrees that it is often while none of the respondents is often the view that the clearance is very often or not at all. The attitude of the authorities should with the responsibility of dumpsite. Clearance is very unpleasant, because the rate of clearance means effectiveness or otherwise.

Table 5.6 Knowledge on Dangers of Refuse.

IS REFUSE A NUISANCE	FREQUENCY	PERCENTAGE.
NO	08	12.1
YES	58	87.9
Total	66	100

Source: Survey data,2001.

Table 5.6 indicates that 87.9% of the respondents are aware of the fact that refuse are dangerous to man and the environment and only 12.1% assert that they are not aware of the menace of refuse to health and the environment. If all the individuals in the society are aware of the dangers posed by refuse, it will in reducing the wanton dumping of refuse. Awareness campaign to enlighten populace about dreaded problem will be a step in the right direction. Table 5.7 Should government continue to clear dump site.

OPTIONS	FREQUENCY	PERCENTAGE
NO	42	63.6
YES	24	36.4
Total	66	100

Source: Survey data, 2001.

Table 5.7 shows that 63.6% of the respondents asserts that government should not be left a lone in dumpsite evacuation. 36.4% are of the view that government should be left alone to do the evacuation. Since large percentage of the respondents would want not only the government to be left a lone in evacuation is a good and effective measure to disabuse the idea that government should be responsible.

Table 5.8 Any Awareness Campaign against Wanton disposal of refuse?.

OPTIONS	FREQUENCY	PERCENTAGE
NO	41	62.1
YES	25	37.9
Total	66	100

Source: Survey data,2001.

Table 5.8, shows that 62.1% of the respondent rejects the fact that there is no awareness campaign as wanton disposal of refuse accept that there is awareness campaign against wanton disposal of refuse. Awareness campaign on the intricate problems and menace of waste disposal will definitely re-address this inherent problem. The finding is seriously surprising because a great percentage of the respondents are view that there is no any awareness campaign against improper solid waste disposal.

Table 5.9, adequate sanitary Situation in the area.

OPTIONS	FREQUENCY	PERCENTAGE
NO	46	69.7
YES	16	30.3
Total	66	100

Source: Survey data,2001.

Table 5.9 indicate that 69.7% of the respondents agree that the sanitary situation o the area is inadequate, 30.3% are of the view that the sanitary situation is adequate. The fact that a very high percentage are of the view that it is inadequate attest to the fact that the respondents or individuals do not take proper and effective management attitude towards environmental sanitation.

Table 5.10 Are the number of dumpsite adequate?.

OPTIONS	FREQUENCY	PERCENTAGE
NO	48	72.7
YES	18	27.3
Total	66	100

Source: Survey data, 2001.

Table 5.10 shows that 72.7% of the respondents claimed that the number of dumpsite are not adequate while 27.3% are of the view that the dumpsite are adequate. If the number of dumpsite are not enough it means that individuals will dump refuse anywhere they feel like, but with enough dumpsites, it will help to reduce the indiscriminate disposal of waste. Dumpsite are very important because it tends to warn the individuals that refuse are not to be dumped anywhere.

Table 5.11 What dangers Does the presence of Refuse poses.

OPTIONS	FREQUENCY	PERCENTAGE
Source of odour.	20	30.3
Breeding place for vectors.	10	15.1
Destroy the aesthetic condition.	12	18.2
Source of fire.	8	12.1
None of the above	-	-
All of the above.	16	24.3
Total	66	100

Source: Survey data,2001.

Virtually all the respondents are aware that refuse poses one problem or the other. From table 5.11 30.3% of the respondents attest to the fact that refuse causes odour, 15.1% are aware that refuse could be breeding place for vectors. None of the respondents attest to the fact that refuse does not pose any problem. The fact that all the respondent are aware of the dangers posed by refuse, makes the issue less complex, because with little awareness in them attitude towards proper refuse disposal will achieve the desire goal.

Table 5.12 Any fee paid for evacuation of dumpsite?.

OPTIONS	FREQUENCY	PERCENTAGE
NO	66	100
YES	-	-
Total	66	100

Source: survey data,2001

Table 5.12 shows that 100% of the respondents attest to the fact that do not pay any fee evacuation of dumpsites. Since the respondents do not pay any fee, it is a pointer that they may not know the value of Source been rendered to them by the relevant authorities. It will be worthwhile if household are charge certain amount for the evacuation of dumpsite. This will increase the effectiveness of the authorities saddled with such duties.

not interested in the business of waste management. This is not a healthy development for solid waste management.

CHAPTER SIX.

6.0 DISCUSSION, CONCLUSION AND RECOMMENDATION.

From the statistical analysis it became obvious that the problems of solid waste disposal are numerous and multi-faceted. One of the identified problems of solid waste disposal is people's attitude of dumping refuse indiscriminately. From observation and personal interview, it was deduced that adults and children are fond of emptying household refuse near the houses, this method is causing a lot of problems to the health and environment at large.

Some individuals are used to dumping refuse inside drainage systems thereby blocking the system and causing flooding and other problems associated with it. The role of attitude towards proper solid waste disposal is one factor that most of the respondents lack and unless they change their attitude, this problem will continue. The inadequacy of waste disposal facilities in the area of study is also compounding the hazards of solid waste. The facilities, where provided, are overstretched by the growing number of people. Rapid growth of human population in the study area could be responsible for the proliferation of various illegal dumpsites.

The responsibility for solid waste disposal has been left absolutely on the shoulder of government and this is one of the greatest militating factors against proper waste disposal. Majority of the respondents are of the view that it is not their responsibility to dispose of refuse but the sole responsibility of government. This impression should be discouraged. Although most of the waste generated

are from domestic activities, still calls for a concerted efforts among the governments, individuals and non-governmental organization towards checking the problem of solid waste disposal.

With respect to storage and collection of waste from homes, most houses used dustbin in form of buckets, and bags. The refuse are collected by individuals from the various household to nearby dumpsites. Open dumping was identified as the most prominent method of waste disposal by household. The various households are not concern with the evacuation of the dumpsite. The dumpsites are evacuated by government agents.

It is absolutely clear that the public or respondents are aware of the dangers of refuse especially as a source of breeding place for vectors, fire hazards injury especially to children and scavengers , odour, poor aesthetic condition e.t.c.Absence of any organized and sustained further awareness programme from government at any level and any organized method of evacuation refuse makes the public to live with heaps of the refuse because of lack of better alternative.

Lack of adequate funding of the government agent saddled with proper solid waste disposal is also one problem threatening effective solid waste management.

6.1 CONCLUSION ASND RECOMMENDATION.

The conclusion to be drawn from the discussion above includes the fact that solid waste generation is directly proportional to the population increase in a given community. As the population increases, the rate of waste increases.

The attitude of individuals towards waste disposal leaves much to be desired. Open system of dumping refuse was recognized as the one adopted and this system has many problems.

Chanchaga settlement has suffered untold hardship and various environmental problems due to inconsistency in the manner of refuse management in the settlement. Government have been left alone take care of waste disposal, this is not suppose to be so. Individuals, private organization and governmental organizations should be encouraged.

In order to check and reduce the incidence of improper waste management, with respect to the research wok, the following recommendations were made.

1. The relevant authority charged with the responsibility of waste disposal should liars with household for adequate arrangement in the provision of dustbin and collection of waste on a regular basis, little fees could be charged. This will improve the sanitation conditions of the environment.
2. Individual and private organization should be enlightened on the need for them to join hands on the business of solid waste management. If individualand private organizations are encouraged in waste managment, it will certainly forestall the problems of waste disposal.

3. Government should embark on massive awareness campaign on the inherent dangers of improper disposal of waste. This should be done using radio, television, newspaper, posters e.t.c.
4. Other effective means of solid waste disposal should be employed. Recycling and incineration method should be used so as to effectively manage waste management.
5. The open dumping site that is prominent amount residents of the study area, the agency responsible for the collection of waste should be well funded and adequately staffed.
6. Designated dumping sites should be strategically located or sited to avoid encroachment to dwelling place, because some of the dumping sites visited are close to houses, market places e.t.c.

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The sample of Questionnaire used.

1. What is the size of your household?
 - a. < 5 persons
 - b. 5 – 10 persons.
 - c. 10 – 15 persons.
 - d. 15 – 20 persons.
 - e. > 20 persons.

2. what waste disposal method do you use?
 - a. Dumpsite.
 - b. Near by pit.
 - c. Incinerator.

What type of refuse do you generate?

- a. Scraps of metal.
- b. Left over food and leaves.
- c. Ceramic and plastic.
- d. Paper and polythene.

Who is responsibility for evacuation / collection of waste from dumpsites.

- a. Government authorities.
- b. Community labour.
- c. Private organization.
- d. Individuals.

5. How often is the dumpsite evacuated or cleaned.

- a. Not at all
- b. Not often.
- c. Often
- e. Very often.

6. Are you aware of the dangers of refuse.

- a. No
- b. Yes

7. Should government continue to clear dumpsite.

- a. No
- b. Yes

8. Are you aware of any awareness campaign against wanton disposal of refuse.

- a. No
- b. Yes

9. Is the sanitary situation in your area adequate

- a. No
- b. Yes.

10. Do you think that the number of dumpsites are enough

- a. No
- b. Yes.

11. What dangers does the presence of refuse pose?

- a. Source of odour
- b. Breeding place for vectors

- c. Disposal the aesthetic condition
- d. Source of fire.
- e. All of the above.

12. Do you pay fee for evacuation of dumpsite.?

- a. No
- b. Yes.

13. Was the government in the abolishment of the weekly environmental sanitation?.

- a. Yes
- b. No

4. Would you like to participate in waste disposal business?

- a. Yes
- b. No